DATA SHEET

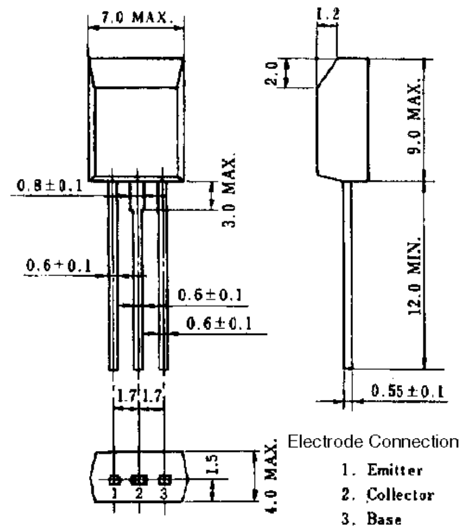
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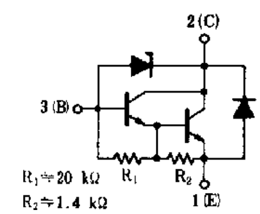
DARLINGTON POWER TRANSISTOR
2SD1843

NPN SILICON EPITAXIAL TRANSISTOR (DARLINGTON CONNECTION) FOR LOW-FREQUENCY POWER AMPLIFIERS AND LOW-SPEED SWITCHING

The 2SD1843 is a Darlington connection transistor with on-chip dumper diode in collector to emitter and zener diode in collector to base. This transistor is ideal for use in acuator drives such as motors, relays, and solenoids.

PACKAGE DRAWING (UNIT: mm)





FEATURES

- High DC current gain due to Darlington connection
- High surge resistance due to on-chip protection elements:
  C to E: Dumper diode
  C to B: Zener diode
- Low collector saturation voltage

ABSOLUTE MAXIMUM RATINGS (T_a = 25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	60±10	V
Collector to emitter voltage	V_{CEO}	60±10	V
Emitter to base voltage	V_{EBO}	7.0	V
Collector current (DC)	$I_{C(DC)}$	±1.0	A
Collector current (pulse)	$I_{C(pulse)}$*	±2.0	A
Total power dissipation	$P_{T(Ta = 25°C)}$	1.0	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	–55 to +150	°C

* PW ≤ 10 ms, duty cycle ≤ 50%

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	V_{CB} = 40 V, I_E = 0			0.5	μA
Emitter cutoff current	I_{EBO}	V_{EB} = 5.0 V, I_C = 0			1.0″	mA
DC current gain	h_{FE2}**	V_{CE} = 2.0 V, I_C = 0.2 A	1000			
DC current gain	h_{FE2}**	V_{CE} = 2.0 V, I_C = 0.5 A	2000		30000	
Collector saturation voltage	$V_{CE(sat)}$**	I_C = 0.5 A, I_B = 0.5 mA			1.5	V
Base saturation voltage	$V_{BE(sat)}$**	I_C = 0.5 A, I_B = 0.5 mA			2.0	V
Turn-on time	t_{ON}	I_C = 0.5 A, R_L = 100 Ω		0.5		μs
Storage time	t_{stg}	I_{B1} = $-I_{B2}$ = 0.1 mA, V_{CC} = 50 V		1.0		μs
Fall time	t_f			1.0		μs

* *Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

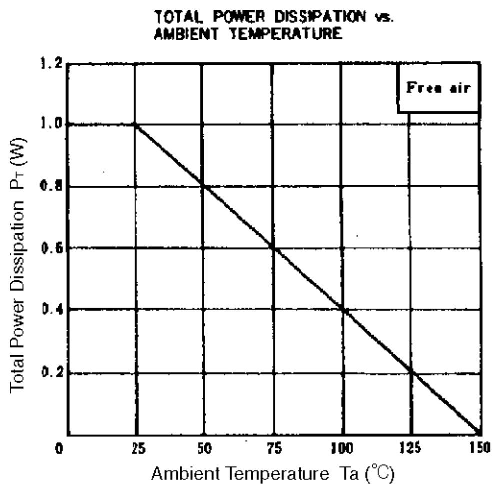
h_{FE} CLASSIFICATION

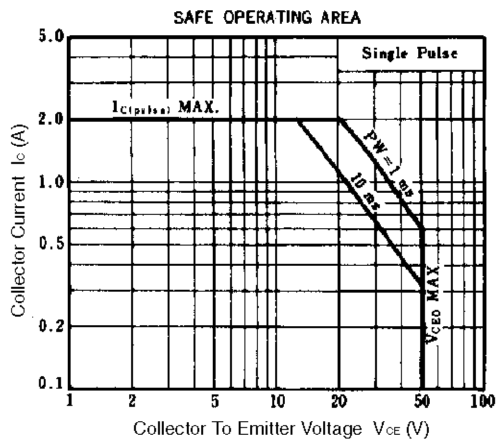
Marking	M	L	K
h_{FE2}	2000 to 5000	4000 to 10000	8000 to 30000

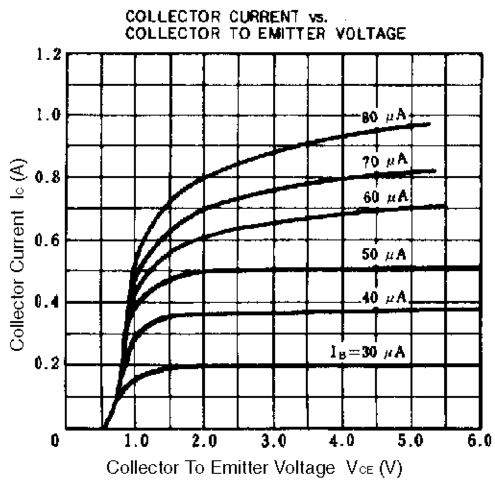
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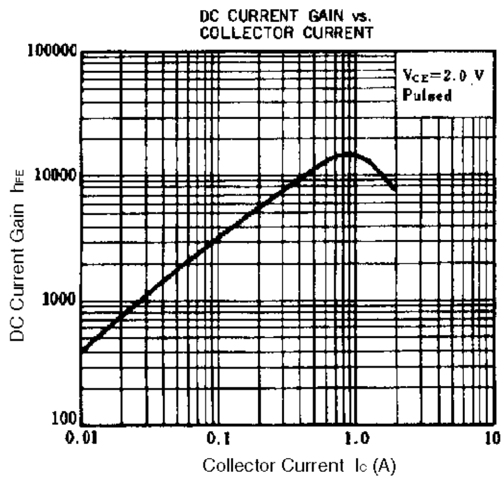
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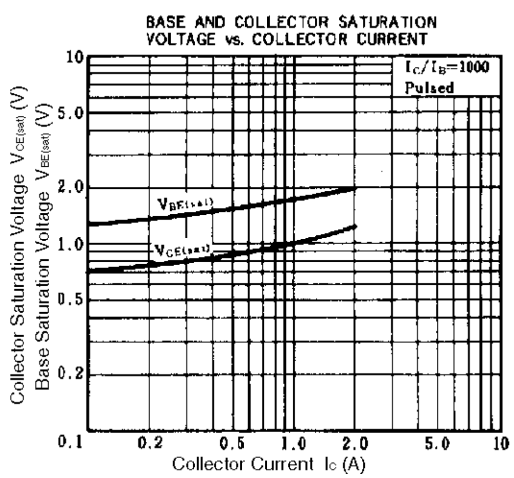
TYPICAL CHARACTERISTICS (Ta = 25°C)











SWICHING TIME (t_{on}, t_{stg}, t_f) TEST CIRCUIT

